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14. ABSTRACT
Recently returned Iraq and Afghanistan veterans with symptoms of PTSD often present first to primary care providers (PCPs) and are reluctant to seek specialty mental health care. Most PCPs have not been trained to assess for and initiate management of PTSD. Given time and cost constraints, web-based instructional programs are increasingly used to facilitate medical education. The aim of this study was to develop and evaluate the effectiveness of a 70-minute web-based PTSD training for PCPs, accredited by the UCSF Office of Continuing Medical Education. The training consisted of 4 modules: (1) Detection and Assessment of PTSD; (2) Comorbid Conditions; (3) Pharmacological Interventions, and (4) Psychotherapeutic Interventions with several clinical vignettes of PCPs interacting with patients to illustrate concepts. Between 12/1/2011 and 12/01/2012, 73 PCPs participated in the online training and completed baseline, end-of-training, and follow-up assessments. We found a significant increase in PTSD-related knowledge at post-training and at 30-days compared to baseline (both p's < 0.001). After the training, PCPs reported significantly increased comfort with 11 of 12 PTSD-related skills; 92% anticipated applying training content in their practices, and after 30 days, 47% reported having done so. Compared with scheduled web-casts, many PCPs preferred the asynchronous web-based modules. Increased PTSD competency among PCPs may help increase detection and symptom management in many patients who would not otherwise receive care.

15. SUBJECT TERMS
Posttraumatic stress disorder, primary care, web-based training, medical education

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TABLE OF CONTENTS

INTRODUCTION

Primary care has been coined the "defacto mental health system" as most mental health care is delivered in primary care settings[1,2,3] Indeed, patients with mental health problems tend to underutilize specialty mental health and use more primary care services than patients without mental health disorders. [4][5][6] This may be particularly true for patients with posttraumatic stress disorder (PTSD) who often present with non-specific somatic complaints. [7,8][4] In addition to limited mental health care capacity,[9] there are also other well-described patient-level barriers to mental health care such as stigma, cultural attitudes, negative symptoms such as avoidance, denial and apathy, and in military service veterans, the failure to recognize that behaviors honed in the warzone, such as hypervigilence, may come to represent mental health symptoms back home. [10][11]

Thus, primary care providers (PCPs) can play a vital role in the initial assessment and treatment of mental health disorders in primary care settings. Most PCPs have received training in the treatment of depression and feel comfortable prescribing anti-depressant medication.[12,13] In contrast, few PCPs have received training in the assessment and management of anxiety disorders, most notably PTSD. [14] A retrospective medical record review revealed that PCPs had correctly identified PTSD in only 46.5% of 746 patients seen in Department of Veterans Affairs primary care clinics later found to have PTSD by gold standard clinical interview, and only 47.7% of these patients had been referred for mental health services.[14] In a study of 539 primary care patients with anxiety disorders, investigators found that nearly half had not been treated[15]; the most common reason being failure of their PCPs to recommend treatment.[16] Thus, PTSD patients presenting in primary care often go unrecognized and untreated which can lead to the

chronic psychosocial, occupational, and functional impairments commonly associated with PTSD.[17]

With growing numbers of Iraq and Afghanistan veterans returning home with PTSD symptoms, there is an increased need to educate PCPs about detection and initial management of PTSD. This may be especially true within national health care systems, such as the VA, with the imperative to respond quickly to an emerging epidemic of mental health problems in returning combat veterans, but limited by shortages of trained mental health clinicians. In addition, since a significant percentage of patients with PTSD will not seek treatment in mental health settings, and veterans, in particular, are reluctant to seek treatment in VA mental health clinics,[6] there is a need to increase competency in the detection and initial management of PTSD among PCPs.

Given time and cost constraints, geographic barriers, and scheduling challenges, use of the internet for primary care training may represent an ideal educational tool. Recent web-based training programs for PCPs on other topics, such as managing intimate partner violence,[18] at-risk drinking,[19] and chronic pain[20] in primary care settings have shown that medical education provided over the web can demonstrably improve clinical competency. A meta-analysis of 201 web-based continuing medical education (CME) trainings showed large effect sizes for improved participant knowledge, skills, and clinical practice behaviors.[21] In addition, web-based CME activities show comparable effects to those observed in costlier in-person trainings. [21] [22]

The US Department of Defense (DoD) and the VA have made efforts to integrate mental health and primary care through national Collaborative Care initiatives,[23, 24] which have included web-

based education for PCPs about common post-deployment mental health problems, including PTSD. Nevertheless, to our knowledge, there are no published reports evaluating the efficacy web-based education programs for PTSD.

Given the lack of evidence for providing PCPs education about PTSD, we developed and evaluated an online training entitled "PTSD Training for Primary Care Providers." The 70-minute evidence-based online training focused on combat-related PTSD, but generalized to other sources of trauma and was designed for use by PCPs both within and outside of the VA healthcare system. The main goals of the training were to educate PCPs about detection, assessment, and initial management of PTSD symptoms, and when and how to refer patients to specialty mental health. We hypothesized that after the training PCPs would demonstrate significant improvements in PTSD-related knowledge and increased comfort with PTSD-related skills. In addition, we hypothesized that these gains would be maintained for at least 30 days after the training and that PCPs would be able to apply course material in their daily practice. We also collected detailed feedback about the content, delivery and technical aspects of the online training to inform future implementation and dissemination efforts.

BODY (No SOW was required for the initial grant proposal; this section contains the methods, results, and discussion of results)

METHODS

Recruitment and Enrollment of PCP Participants

The online "PTSD Training for Primary Care Providers" course was accredited by the University of California, San Francisco Continuing Medical Education (CME) Program. PCPs were recruited for the pilot training and evaluation study in two main ways: (1) emails to primary care clinic leads in the VA, DoD, and other healthcare systems, and (2) emails to roughly 5,000 physicians who subscribed to the UCSF CME listserve. Potential participants were directed to click on an online hyperlink where they read an information sheet describing the study. Those consenting to participate then completed an eligibility screen. Eligible participants were English-speaking PCPs, including licensed physicians (internists, family practitioners, pediatricians), nurse practitioners, physician assistants, as well as trainees and students in these fields. The study was approved by the Institutional Review Boards of the University of California, San Francisco, the San Francisco VA Medical Center, and the funder, the US DoD.

Study Procedures

After eligibility was confirmed, the study coordinator contacted the participant and assigned them a confidential and anonymous username and password and a link to the data management platform (DatStat 4.7.1©) containing the online training and study assessment instruments. Prior to the training, participants completed an online baseline assessment to collect sociodemographics and information about participants' profession, level of training, practice or

training environment, main focus (clinical, teaching, etc.), and whether participants' caseload included military service personnel or veterans.

The baseline assessment (T_0) was followed by an introductory and 4 online narrated video training modules (**Figure 1**). The online training was designed to be self-paced; thus, participants could stop and start the training as needed. Immediately after finishing the training, participants completed the online post-training assessment (T_1) and one month later they completed the 30-day post-training assessment (T_2). Total participation time, including completion of all 3 study assessments, was approximately 2 hours. After study completion, participants were given the option of receiving 2 units of CME through UCSF (or $25 reimbursement in lieu of CME credit).

Intervention

A primary care internist (KHS) and psychologist specializing in PTSD (KWS) collaborated to develop an evidence-based online training entitled "PTSD Training for Primary Care Providers". The training was scripted and narrated and included multi-media didactic content, case presentations with Q & A, and videotaped clinical vignettes to demonstrate the use of training concepts and techniques in clinical practice. A beta version was piloted in a focus group of PCPs and mental health clinicians to solicit feedback prior to finalizing content.

The main aim of the training is to educate primary care providers in the diagnosis, assessment, initial management, and referral of patients with PTSD. The Introductory Module provides a rationale for providing education about PTSD to PCPs which is dramatized in a video of an Iraq

veteran describing his symptoms to his girlfriend and expressing his reluctance to seek mental health treatment but willingness to explore help for his sleep problems. His girlfriend encourages him to go to the VA to see his PCP, thus setting the stage for the PCP PTSD training. The introduction presents an overview of the 4 training modules that follow (**Figure 1**).

Outcomes Assessment

Primary Outcome

The primary outcomes were change in knowledge from pre- to post-test following the training (T_1) and retention of knowledge from pre-test to 30-day follow-up (T_2). We also evaluated change in level of reluctance and comfort in assessing for and initiating management of PTSD symptoms at the T_1 and T_2 time points compared to baseline (T_0).

PTSD-Related Knowledge: We initially constructed 10 multiple-choice knowledge questions that tested knowledge of the content in each of the 4 training modules. Clinical problem-solving questions used patient scenarios. Consistent with test construction theory,[25] the 10 questions were then piloted with the first six PCP participants and were either further modified or deleted if a high rate (>60%) of respondents answered them incorrectly after completing of the course. (**See Table 2 for knowledge domains assessed**.)

Reluctance and Comfort: These questions were constructed based on prior literature about provider barriers to PTSD treatment ("reluctance") [26] and comfort with PTSD-related skills targeted in the training. Both reluctance and comfort questions were scored using a Likert scale from 1 to 4 with lower scores indicating less reluctance and higher scores greater comfort with specific PTSD-related skills. (**See Table 3 for reluctance and comfort items assessed**.)

Secondary Outcomes- Feedback on the Training

Immediately following the training and 30 days later, participants rated several different aspects of the training on a 4-point Likert scale. Questions about technical aspects of the training were included to obtain web analytic data. In addition, participants provided open-ended qualitative feedback about the training including strengths and weaknesses and least and most helpful topics in clinical practice.

Data Analysis

Change in knowledge, reluctance, and comfort were evaluated statistically by comparing changes in mean test scores over time using paired t-tests based on null hypotheses of zero change from baseline. Bonferroni corrections were applied to account for multiple comparisons; significance thresholds are indicated in footnotes for these tables. For the Knowledge items, for each time point, we calculated both the overall mean scores and sub-scores for each of the four modules. Qualitative data were extracted from the online data management system by collating each participant's response to open-ended questions. An expert in qualitative data analysis (CJK) used standard constant comparison techniques (CITE) to construct general categories that accounted for both similarity and difference across responses. Similar responses were grouped into super-ordinate categories that are reported as general themes.

RESULTS

<u>*Participants*</u>

From October 2011 to December 2012, 230 eligible PCPs were enrolled in the study; 128 PCPs completed the pre-test, but may or may not have competed the online training; 86 completed the pre-test, the online training and the post-test, and 73 completed the online training and all 3 study

assessments including the 30-day follow-up assessment. Of the 73 PCPs in the analytic sample, 69% were female and were primarily physicians (60%) and nurse practitioners (18%). The majority (81%) had completed their clinical training and 92% were currently practicing. Dominant practice settings were VA facilities (21%), community health centers (23%), and university-based practices (22%). Most reported caring for veterans (63%) and the vast majority (74%) spent most of their time in clinical practice (**Table 1**).

Knowledge of PTSD-Related Detection and Initial Management of Symptoms

Overall baseline PTSD-related knowledge was poor, with mean pre-test scores of 45.9%. Completion of the PTSD training led to significant improvements in PTSD-related knowledge from pre-test (T_0) to post-test (T_1) (mean change score =28.8%, SD +/- 21.5%), representing a significant increase in knowledge (t (72) = 11.4, p< 0.001). Overall PTSD-related knowledge was retained over a 30-day period with follow-up mean change scores (T_2) maintaining a gain of 17.5% (SD+/- 22.1%) compared to baseline (T_0), (t (72) =6.7, p < 0.001). Compared to baseline (T_0) knowledge, participants demonstrated significant improvements at post-test (T_1) in mean knowledge scores for each of the four modules (all p's ≤ .001); mean change scores ranged from 20% to 47% for knowledge of comorbid conditions, psychotherapeutic interventions, detection and assessment of PTSD, and pharmacological interventions in ascending order. At 30 day follow-up (T_2), participants demonstrated significant retention for all modular content (all p's < .02) with the exception of psychotherapeutic interventions for PTSD.

Reluctance and Comfort in Providing PTSD-Related Care in Primary Care

After the training, at post-training and at the 30-day follow-up assessment, participants reported changes in their attitudes towards providing PTSD-related care for their primary care patients (Table 3). At baseline, the two factors that contributed to the most reluctance to manage PTSD in primary care were: (1) lack of time, and (2) not knowing the appropriate intervention. Following the training and at 30 days, participants reported significantly decreased reluctance to manage PTSD with the greatest improvements in knowledge of appropriate PTSD interventions and fewer believing that PTSD is best handled by specialists (p's ≤ .001 at both time points). Following the training, at both time points, participants demonstrated significantly improved comfort with 11 of 12 skills related to detecting, assessing and managing patients with PTSD (all p's at both time points < .001) The biggest post-training gains in comfort level sustained at 30 days were: (1) assessing and prescribing medication for a patient with PTSD-related nightmares, (2) using the 4-item primary care PTSD screen to quickly assess patients for PTSD, (3) differentiating acute stress disorder from PTSD, (4) explaining psychotherapeutic options for PTSD treatment to patients, and (5) prescribing medication to treat PTSD (**Table 3**).

__Participant Feedback__

Table 4 shows participants' quantitative ratings of the training in a number of categories. In sum, the majority of participants endorsed the training as moderately to very enjoyable, not burdensome, educational, and effectively delivered as online content. Of note, nearly 30% found the training to be too long. After completing the training, 90% anticipated being able to apply the training to their clinical practices and at the 30-day follow-up evaluation, 47% reported having done so. Also, at 30-days, 86% reported that they would recommend this training to their PCP colleagues (**Table 4**). Figure 2 summarizes PCPs' responses to open-ended questions

embedded in the pre-test (T_0), post-test (T_1) and 30-day follow-up assessment (T_2). Some participants felt that the training was not interactive enough and hence might not compete with other online distractions. One participant suggested interspersing test questions throughout the module that would require learners to physically click on answers and then receive feedback on their responses (**Figure 2**).

DISCUSSION

PCPs who had little prior knowledge of PTSD demonstrated significant short-term gains in PTSD-related knowledge and skills after completing the 70 minute pilot online PTSD training. Of note, the biggest gains resulting from the training were in knowledge of medications used to treat PTSD and PTSD-related symptoms, such as sleep disorders. Perhaps the training helped PCPs realize that the same medications they commonly use to treat depression (e.g., SSRIs) are also evidence-based FDA-approved medications for PTSD. Similarly, PCPs are well-versed in the treatment of insomnia and the training may have helped them realize that they can decrease a substantial source of morbidity from PTSD hyperarousal and re-experiencing symptoms by using medications with which they are already familiar (e.g., trazodone, prazosin etc.).

Although there were initial large increases in PTSD knowledge, after 30 days, while still significantly increased, these gains had diminished somewhat. As shown in other educational intervention studies[21], sustained gains will require further reinforcement, booster training, clinical practice, and/or mentoring. Of note, the VA National Center for PTSD offers a PTSD mentoring program and PTSD hotline providing clinical support for VA clinicians, but to date, these resources have not been promoted to PCPs. Moreover, PCPs outside of the VA system

may not be aware of these resources, although increasingly their caseloads include veterans of Iraq and Afghanistan with symptoms of PTSD. Thus, more clinical resources targeted at supporting and mentoring PCPs, both within and outside the VA, could greatly expand access to PTSD treatment for patients who might not otherwise receive it.

Our results also showed that while PCPs appreciated learning about evidence-based treatments for PTSD, including hypothesized underlying mechanisms, their knowledge and understanding of these psychotherapies were not maintained after 30 days. Having a trusted PCP explain in plain language the rationale for evidence-based trauma-focused psychotherapies to a patient suffering from PTSD can be critical in encouraging patients to initiate and stick with treatment, particularly as these therapies can be emotionally trying for patients and large numbers of patients drop out prematurely. [6][27] The training also explained and demonstrated the use of Motivational Interviewing to promote treatment engagement in patients and several participants reported that this was one of the most useful components of the training.

Some limitations of this low-budget pilot study should be noted. First, this was not a randomized, controlled trial that included a control group of PCP's who did not receive the training. Second, there were most certainly biases introduced by a convenience sample of participants who opted to participate in and complete the training, yet we could detect no significant differences between participants that did and did not complete the training. Third, the sample size was relatively small, although was adequately powered to test a circumscribed set of study hypotheses. In addition, although we assessed 30-day retention in knowledge and comfort with PTSD-related skills, we did not assess for long-term impact of the training, nor did we audit

objective evidence of the training's impact on clinical practice through medical chart review. Finally, our curriculum focused primarily on the management of PTSD in veterans, specifically veterans of Iraq and Afghanistan. Future modifications of this curriculum would further broaden content to more fully address non-combat trauma.

In sum, PCPs who completed an online 70-minute self-paced training in the assessment and initial management of PTSD showed significant short-term gains in PTSD-related knowledge and reported increased comfort in nearly all PTSD-related clinical skill assessed. Future implementation efforts will incorporate participant feedback indicating a need for more interactive content and resolution of web-related technical problems. In addition, consideration will be given to adapting the training for mobile technologies. Results from this study add to a growing literature demonstrating the effectiveness of web-based curricula in the continuing education of physicians. [21] In particular, given the numerous barriers to specialty mental health treatment, coupled with a demonstrated preference for primary care among PTSD patients, increasing PTSD competency among PCPs may help increase the reach of detection and symptom management in many patients who might not otherwise receive care.

KEY RESEARCH ACCOMPLISHMENTS

- Dr. Samuelson presented preliminary findings at International Society for Traumatic Stress Studies (ISTSS) conference in November 2011.

- Dr. Seal received confirmation for a poster presentation at the Society of General Internal Medicine meeting (SGIM) in April 2013.

- Received RRP grant award for TBI Educational Videos. The grant application referenced Dr. Seal's work developing videos for "Online PTSD Training for Primary Care Providers."

- Dr. Seal submitted a study abstract to the International Society for Traumatic Stress Studies to be included in a symposium of web-based PTSD innovations.

- Manuscript to be submitted to the *Journal of General Internal Medicine.*

- Based on pilot study data, Dr. Seal has begun to develop a collaboration with investigators in Israel to develop a similar online and mobile app training for Israeli primary care and ancillary health care providers working with trauma-exposed populations

REPORTABLE OUTCOMES

- Given the number of competing priorities for their time, primary care providers (PCPs) are a challenging population to enroll in an online educational training. While we were able to enroll over 200 PCPs for the online PTSD training, less than half completed training and post-training follow-up assessment after 1 month. Continuing Medical Education (CME) credit was likely an important incentive for study retention.

- Among PCPs enrolled in the study, *baseline* knowledge of PTSD was poor and *at baseline*, PCPs had high reluctance and low comfort with several PTSD-related skills.

- PCPs who completed the online training, made significant and sustained gains in their knowledge of PTSD detection and initial management and reported decreased reluctance and increased comfort with the vast majority of PTSD-related skills assessed.

- At the conclusion of the training, over 90% of PCPs anticipated being able to apply the training to their clinical practices. Just after 1 month, slightly less than one-half of participants reported having used training concepts in their clinical practice.

- PCPs preferred the flexibility of asynchronous, self-paced online modules as opposed to scheduled webcasts.

- Some participants had technical difficulties with the pilot online training and this may have caused them to drop out of the training.

- Participants suggested adding more interactive content to future iterations of the online PTSD training.

CONCLUSION

In sum, PCPs who completed an online 70-minute self-paced training in the assessment and initial management of PTSD showed significant short-term gains in PTSD-related knowledge and reported increased comfort in nearly all PTSD-related clinical skill assessed. Future implementation efforts will incorporate participant feedback indicating a need for more interactive content and resolution of web-related technical problems. In addition, consideration will be given to adapting the training for mobile technologies. Results from this study add to a growing literature demonstrating the effectiveness of web-based curricula in the continuing education of physicians. [21] In particular, given the numerous barriers to specialty mental health treatment, coupled with a demonstrated preference for primary care among PTSD patients, increasing PTSD competency among PCPs may help increase the reach of detection and symptom management in many patients who might not otherwise receive care.

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APPENDICES: None

SUPPORTING DATA:
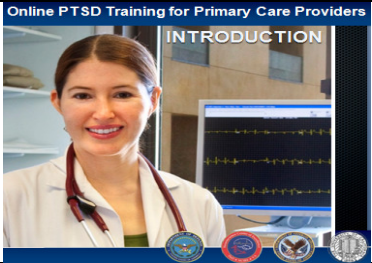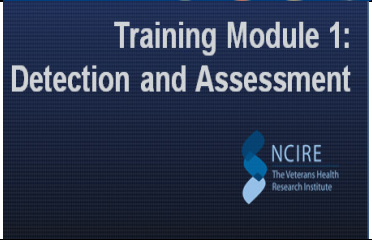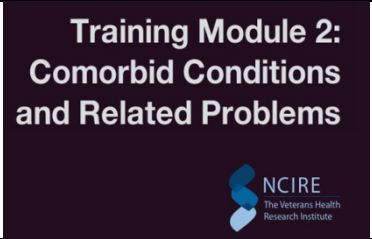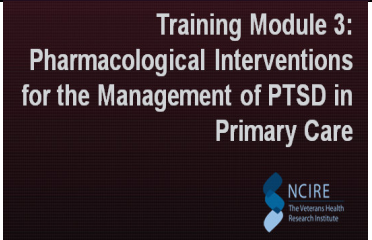**Figure 1. Description of Training Modules**
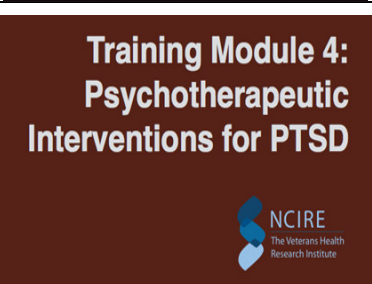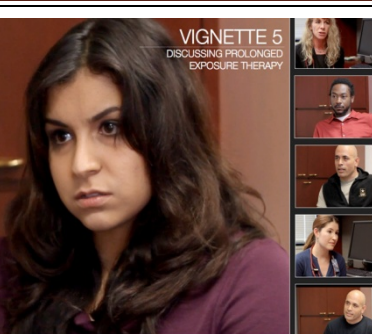
Module	Content
	Introduction • Introduction to PTSD in primary care • Health effects of PTSD • Under-detection of PTSD in primary care • Barriers to PTSD treatment in primary care
	Module 1: • PTSD diagnostic criteria • Validated screening tools: PC-PTSD Screen & PTSD Checklist • Sample assessment questions
	Module 2: • Introduction to common comorbid conditions (e.g., depression, TBI, adjustment disorder, etc.) • Case studies with differential diagnoses to distinguish PTSD from related disorders with overlapping symptoms
	Module 3: • Reviews evidence-based pharmacological treatments for PTSD and related problems • Includes dosage, side effects, and contraindications • Cautions against use of benzodiazepines
	Module 4: • Introduces evidence-based psychotherapies for PTSD so that PCPs can explain these to their patients when referring • Explains underlying mechanism of action • Introduces Motivational Interviewing to help with mental health treatment engagement • Provides guidance for when to refer patients to specialty mental health
	Five Clinical Vignettes: • **Intro:** Iraq veteran describes PTSD symptoms, but will only go to see his PCP for his "sleep problems" • **Module 1:** PCP assesses for PTSD symptoms and provides feedback to veteran. • **Module 3:** PCP recommends prazosin for the treatment of nightmares to a veteran who is resistant to medications • **Module 4:** PCP models: **(a)** Describing Prolonged Exposure Therapy and **(b)** Motivational Interviewing with patient

Table 1: Characteristics of Participants (N=73)

Participant Characteristic	N	(%)
Gender		
Male	23	31.5%
Female	50	68.5%
Profession		
Nurse Practitioner	13	17.8%
Family Practice	20	27.4%
Internal Medicine	21	28.8%
Pediatrics	3	4.1%
Physician's Assistant	2	2.7%
Student	8	11.0%
Post-graduate	6	8.2%
Years of Clinical Practice mean (SD)	13.5	(13.0)
Practice type		
University Practice	16	21.9%
Veterans Affairs	15	20.5%
Department of Defense	1	1.4%
Community Health Center	17	23.3%
Hospital-Based Practice	10	13.7%
Health Maintenance Organization	4	5.5%
Locum Tenens	3	4.1%
Federal or State Clinics	1	1.4%
Other	6	8.2%
Main work focus		
Providing clinical services	54	74.0%
Administration	5	6.8%
Teaching	3	4.1%
Research	2	2.7%
Student	9	12.3%
Caseload includes military service personnel / veterans		
No	25	37.3%
Yes	42	62.7%
Previous participation in online training		
No	9	12.3%
Yes	64	87.7%

Table 2: Pre-Training, Immediate Post-Training, and Follow-up Knowledge Scores (N=73)

Content Assessed (percent answering correctly)	Pre-Training (T$_0$)		Post-Training (T$_1$)				Follow-Up (T$_2$)		
	N	Mean Score	Mean Score	Mean Change (Std. Dev)	p		Mean Score	Mean Change (Std. Dev)	p
Module 1: Detection and assessment of PTSD	73	52.7%	79.5%	26.7% (36.4%)	<.001*		64.4%	11.6% (40.4%)	.016*
Module 2: Comorbid conditions and differential diagnoses	73	51.6%	71.2%	19.6% (30.8%)	<.001*		64.4%	12.8% (34.5%)	.002*
Module 3: Pharmocological interventions for PTSD	73	36.3%	83.6%	47.3% (40.7%)	<.001*		70.5%	34.2% (35.2%)	<.001*
Module 4: Psychotherapeutic interventions for PTSD	73	34.2%	57.5%	23.3% (59.0%)	.001*		43.8%	9.6% (58.1%)	.163
Overall Mean Score	73	45.9%	74.7%	28.8% (21.5%)	<.001*		63.4%	17.5% (22.1%)	<.001*

* *Significant results indicated with stars. Using Bonferroni corrections, significance threshold is .025 for all comparisons.*

Table 3: Pre-Training, Post-Training, and Follow-Up Reluctance & Comfort Scores (N=73)

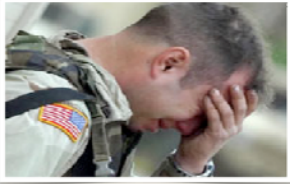| Question	Pre-Training (T_0)		Post-Training (T_1)			Follow-Up (T_2)		
	N	Mean Score	Mean Score	Mean Change (Std. Dev)	p	Mean Score	Mean Change (Std. Dev)	p
Reluctance (Likert scale of 1-4, with lower scores indicating less reluctance)								
Lacking sufficient time	73	2.8	2.6	-0.2 (0.6)	.015	2.6	-0.2 (0.8)	.124
Not knowing the appropriate intervention	73	2.7	1.9	-0.8 (0.9)	.001*	2.0	-0.7 (0.9)	<.001*
Believing these problems are best addressed by specialists	73	2.3	1.9	-0.4 (1.0)	.001*	1.9	-0.4 (0.9)	.001*
Feeling inadequately supported by mental health specialists	73	2.3	2.0	-0.2 (0.8)	.028	2.0	-0.2 (0.7)	.015
Concerned at becoming overly upset by descriptions of the trauma	73	1.3	1.2	-0.1 (0.5)	.375	1.2	-0.1 (0.5)	.375
Concerned about negatively impacting your relationship with the patient	73	1.4	1.3	-0.0 (0.6)	.552	1.3	-0.1 (0.6)	.146
Comfort (Likert scale of 1-4, with higher scores indicating greater comfort)								
Assessing an Iraq or Afghanistan veteran who has nightmares	73	2.2	3.2	1.0 (0.9)	<.001*	3.0	0.8 (0.8)	<.001*
Assessing a veteran for PTSD using the PTSD Screen for Primary Care Providers	73	2.4	3.3	0.9 (1.0)	<.001*	3.3	0.8 (0.9)	<.001*
Differentiating Acute Stress Disorder from PTSD	73	2.0	3.2	1.1 (0.9)	<.001*	3.0	0.9 (0.7)	<.001*
Assessing for comorbid conditions related to PTSD	73	2.4	3.1	0.7 (0.8)	<.001*	3.1	0.7 (0.7)	<.001*
Describing and normalizing symptoms of PTSD	73	2.4	3.2	0.8 (0.9)	<.001*	3.2	0.8 (0.8)	<.001*
Describing the psychotherapeutic treatment options for PTSD	73	1.9	3.0	1.1 (0.9)	<.001*	2.8	0.9 (0.8)	<.001*
Using Motivational Interviewing to help engage a patient in mental health treatment	73	2.2	3.0	0.8 (0.9)	<.001*	2.9	0.7 (0.8)	<.001*
Prescribing medication to treat a sleep disorder	73	2.9	3.3	0.5 (0.6)	<.001*	3.2	0.3 (0.7)	<.001*
Prescribing medication to treat nightmares	73	2.1	3.1	1.0 (0.9)	<.001*	2.9	0.8 (0.8)	<.001*
Prescribing medication to treat depression	73	3.3	3.4	0.1 (0.6)	.211	3.3	0.1 (0.7)	.509
Prescribing medication to treat PTSD	73	2.1	3.1	0.9 (0.9)	<.001*	2.9	0.7 (0.7)	<.001*
Knowing when to refer a patient with PTSD symptoms for specialty mental health	73	2.8	3.4	0.6 (1.0)	<.001*	3.4	0.6 (0.8)	<.001*

* Significant results indicated with stars. Using Bonferroni corrections, significance threshold for Reluctance items is 0.004 and significance threshold for Comfort Items is 0.002.

Table 4: Post-Test Survey (N=73)

Survey Item	N	(%)
Overall, how enjoyable did you find this training?		
Not at all	1	1.4%
Slightly	9	12.3%
Moderately	43	58.9%
Very	20	27.4%
Overall, how educational did you find this training?		
Not at all	0	0.0%
Slightly	2	2.7%
Moderately	30	41.1%
Very	41	56.2%
Overall, how burdensome did you find this training?		
Not at all	27	37.0%
Slightly	33	45.2%
Moderately	12	16.4%
Very	1	1.4%
Was this training effectively delivered as an on-line training course?		
Not at all	1	1.4%
Slightly	2	2.7%
Moderately	32	43.8%
Very	38	52.1%
Was the training too long?		
Not at all	33	45.2%
Slightly	19	26.0%
Moderately	15	20.5%
Very	6	8.2%
Module 1: Detection and Assessment of PTSD		
Not at all Useful	3	4.1%
Slightly Useful	4	5.5%
Moderately Useful	23	31.5%
Very Useful	43	58.9%
Module 2: Comorbid conditions and differential diagnoses		
Not at all Useful	1	1.4%
Slightly Useful	5	6.8%
Moderately Useful	28	38.4%
Very Useful	39	53.4%
Module 3: Pharmocological interventions for PTSD		
Not at all Useful	1	1.4%
Slightly Useful	4	5.5%
Moderately Useful	21	28.8%
Very Useful	47	64.4%

Survey Item	N	(%)
Module 4: Psychotherapeutic interventions for PTSD		
Not at all Useful	3	4.1%
Slightly Useful	7	9.6%
Moderately Useful	25	34.2%
Very Useful	38	52.1%
Clinical Vignettes		
Not at all Useful	1	1.4%
Slightly Useful	10	13.7%
Moderately Useful	19	26.0%
Very Useful	43	58.9%
Did you experience technical difficulties?		
No	37	50.7%
Yes	36	49.3%
Would you recommend this training to your primary care colleagues?	48	65.8%
Unlikely	2	2.7%
Maybe	9	12.3%
Likely	24	32.9%
Definitely	38	52.1%
Overall, do you think you will be able to apply what you learned? (T_1)		
Unlikely	2	2.7%
Maybe	5	6.8%
Likely	30	41.1%
Definitely	36	49.3%
Have you applied the training to your clinical practice? (T_2)		
No	39	53.4%
Yes	34	46.6%

25

Figure 2. Summary of Participants' Pre- and Post-Training Qualitative Feedback

Topical area	Quotations
Reasons for participation 	• I want to better identify and treat my patients with PTSD. • Hoping this will make me a better doctor for veterans. • To gain better strategies for patients with complex PTSD related to non-combat trauma (a significant population in my practice) and to learn about assessment and management of combat trauma (a new area of my practice).
Relevance to clinical work 	• I appreciated the brief introduction to pharmacologic and psychotherapies currently demonstrated to be effective and the supporting brief discussion as to WHY! • The need to explore issues of intrusive thoughts, nightmares, etc. Will also use this in evaluating patients with insomnia in case this is due to unappreciated PTSD. • Motivational interviewing [is one] application to help them [patients] make the choice to get treatment.
Training strengths 	• The mixture of learning modalities kept me interested and learning. • You can do the module anywhere, anytime…Covers a topic that PCPs may not read about in their spare time (given all the other medical topics that they need to stay current on). • Experienced clinicians on vignettes, good acting; may not be realistic for 20 minute visits. • I liked the convenience of doing as many modules as I liked at a time that was convenient for me. In fact, the idea of a live webcast doesn't appeal to me as I would have to commit to a specific time.
Training weaknesses 	• Online training is challenging because it can be passive. I don't know that this version has enough active steps by the learner to keep them engaged if they are alone watching the training in their own office. I suspect many people would multi-task away from the sessions. • It would have been nice to have the training more interactive – i.e., ask a question, then have to click a box, then the answer would appear.